REMARKS/ARGUMENTS

Claims 1, 4-10, 13, 14, 17-19 and 24-29 are pending herein. Claim 1 has been amended as supported by Fig. 1 of the present application, for example. Claims 2, 11 and 15 have been cancelled without prejudice or disclaimer. New independent claims 27-29 have been added and include the subject matter of cancelled claims 2, 11 and 15, respectively. Claims 17-19 are allowed and claims 8-10 are allowable.

1. Claims 1, 4-7, 13, 14 and 24-26 were rejected under §103(a) over JP 2000-25241 in view of Baba. To the extent that this rejection may be applied against the amended claims, it is respectfully traversed.

Amended claim 1 recites, among other things, a less-dust-generative piezoelectric/electrostrictive (P/E) device comprising a plurality of pillar-shaped P/E elements which are formed integrally with the ceramic substrate and which extend upwardly from the ceramic substrate forming at least a 2 × 2 matrix.

Applicants respectfully submit that any combination of JP '241 would have failed to disclose a pillar-shaped P/E element extending upwardly forming at least a 2 × 2 matrix. JP '241 discloses a 1 × 6 matrix, and Baba discloses a 1 × 3 matrix. Therefore, both JP '241 and Baba fail to disclose at least a 2 × 2 matrix, as recited in claim 1. There is also no motivation to modify JP '241 to include more than a 1 × n matrix, because the channels formed as a result of the "1" in the 1 × n matrix are necessary for the device to function as an inkjet.

In addition, Applicants respectfully submit that one skilled in the art would not have been motivated to modify the P/E elements of JP '241 to be pillar-shaped. JP '241 discloses, in Fig. 1, a P/E actuator used as an inkjet printing head. Ink is supplied through a hole in plate 7, is stored and pressurized in the channels 2, and is ejected through holes 5 and a nozzle plate 6. The channels 2 must be of sufficient length to insure an adequate supply of ink and to provide a sufficient amount of volume displacement. Accordingly, pillar-shaped P/E elements would not produce the necessary length capacity and volume displacement.

Furthermore, there would be no motivation to combine these references in the first instance, as JP '241 discloses an inkjet printing head while Baba discloses a P/E gyroscope; two very different technologies. Therefore, one skilled in the art would not have been motivated to modify the P/E elements of JP '241 to be pillar-shaped, as shown in Baba.

In addition to all of the above, Applicants respectfully submit that Baba fails to disclose or suggest any motivation to prepare the structure of Baba in such a way that the surfaces are fired, but unprocessed. The shape of the P/E elements disclosed in Baba preclude using the process disclosed in JP '241 to provide the device of Baba with fired, but unprocessed surfaces. Specifically, JP '241 discloses manufacturing a P/E device using a molding technique. Removing an object from mold requires a force linearly related to the surface area of the molded item. A part must have sufficient tensile strength, which is linearly related to the tensile area of the part, to overcome the removal forces based on the surface area. A pillar-shaped part has a relatively large surface area to tensile area ratio when compared to a wall shape, such as is disclosed in JP '241. Applicants respectfully submit that due to their large surface area to tensile area ratio, the elements of Baba (in the "green" state no less) could not be molded using the process of JP '241. Therefore, one skilled in the art would not have been motivated to manufacture the P/E device of Baba using the manufacturing technique of JP '241.

For at least the reasons explained above, Applicants respectfully submit that the presently claimed less-dust-generative P/E device comprising, among other things, a plurality of pillar-shaped P/E elements which are formed integrally with the ceramic substrate and which extend upwardly from the ceramic substrate forming at least a 2×2 matrix, would not have been obvious to one skilled in the art given the disclosure of

JP '241 and Baba. Since claims 4-7 and 25 depend either directly or indirectly from claim 1, those claims are also believed to be allowable over the applied art.

With reference to the instant rejection as it applies to claim 24, Applicants respectfully traverse the Examiner's assertion that "it would have further been obvious to one having ordinary skill in the art to provide a lid to the Baba device, at the time of their invention to provide protection to the device, which a lid always suggests (Office Action, page 7, lines 2-4). The lid 4 of JP '241 is disclosed as being placed over the chambers 2 after the electrodes 8 are formed. The lid 4 is used to close the chambers 2 and is not used for "protection." The chambers 2 would not function to eject a solution if the lid 4 were not present in JP '241. No such functional requirement exists in Baba.

Furthermore, the device of Baba would not function properly as a P/E gyroscope if a lid were to be placed on the pillar-shaped elements, as such a lid would restrict the free movement of the elements.

For at least these reasons, a less-dust-generative P/E device comprising, among other things, a lid section connecting the one P/E element to the other P/E element, as recited in claim 24, would not have been obvious to one skilled in the art given the disclosure of JP '241 and Baba. Since claims 13, 14 and 26 depend from claim 24, those claims are also believed to be allowable over the applied art.

2. The rejection of claims 2, 11 and 15 under §103(a) over Chae in view of JP '241 and Baba is noted, but deemed moot in view of the cancellation of claims 2, 11 and 15. Please note that claims 2, 11 and 15 have been rewritten in independent form. Applicants respectfully submit that the arguments submitted above distinguish claims 1 and 24 from JP '241 and Baba. Since Chae does not overcome the deficiencies of JP '241 and Baba, and since new claims 27 and 28 include the features recited in claim 1, and claim 29 includes the features recited in claim 24, claims 27-29 are also believed to be allowable over the applied art.

For at least the foregoing reasons, Applicants respectfully submit that all pending claims herein define patentable subject matter over the art of record. Accordingly, the Examiner is requested to issue a Notice of Allowance for this application in due course.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

May 8, 2006
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